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NATIONAL RESEARCH COUNCIL
COMMISSION ON ENGINEERING AND TECHNICAL SYSTEMS

2101 Constitution Avenue Washington, D. C. 20418

EXECUTIVE DIRECTOR

202334-2400

April 25, 1985

Mr. Lewis L. Peach, Jr.
Technical Representative
Code R
NASA Hqts
Washington, D.C. 20546

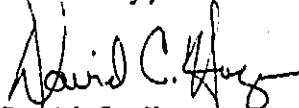
Dear Mr. Peach,

Under the provisions of Contracts NASW-4003 and NASW-3455 between the National Aeronautics and Space Administration and the National Academy of Sciences, I am pleased to transmit herewith two reports that summarize the activities of the Aeronautics and Space Engineering Board for the period January 1, 1985 - March 31, 1985.

One report summarizes the activities conducted under Contract NASW-4003 and the other summarizes those conducted under Contract NASW-3455. The latter contract that was to terminate September 30, 1984 was extended at no cost to permit the publication of reports of work initiated earlier.

If you have any questions or comments regarding the report, I would welcome the opportunity to discuss them with you.

Sincerely,


David C. Hazen

Enclosures

cc:

NASA Scientific and Technical
Information Facility (3 copies)

(NASA-CR-175825) [ACTIVITIES OF THE
AERONAUTICS AND SPACE ENGINEERING BOARD]
Summary Report, 1 Jan. - 31 Mar. 1985
(National Academy of Sciences - National
Research) 13 p HC A02/MF A01

N85-26610

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Summary of Activities

January 1 - March 31, 1985

Aeronautics and Space Engineering Board

Commission on Engineering and Technical Systems

Report

to the

National Aeronautics and Space Administration

under Contract NASW-3455

between the

National Aeronautics and Space Administration

and the

National Academy of Sciences

April 1985

The total summary of activities of the Aeronautics and Space Engineering Board (ASEB) for the period January 1, 1985 - March 31, 1985 is in two reports. One report covers the activities under Contract NASW-3455 and the other covers the activities under Contract NASW-4003. These reports fulfill a contractual obligation to the National Aeronautics and Space Administration. This report covers the activities under Contract NASW-3455 and is the eighteenth summary-of-activities report and the tenth to be submitted under contract NASW-3455 which began October 1, 1982 and was extended to expire on June 30, 1985. The Statement of Task in effect during this reporting period is attached. (Attachment 1)

ASEB Meetings

There were no meetings of the Board during this reporting period.

ASEB Membership

The current Board membership is shown in Attachment 2.

ASEB Committee Activities

Workshop on Aeronautical Technology in the Year 2000

The Workshop on Aeronautical Technology in the Year 2000 was held January 15-19, 1984 in Austin, Texas. Eight workshop panels' reports were compiled into a workshop report. The workshop report was published October 5, 1984.

As a follow-on to the workshop, an ad hoc Vehicle Application Panel was formed to translate and focus the workshop technological projections into advanced flight vehicle concepts. The VA Panel is comprised of some members of the workshop's Systems Integration Panel augmented by additional experts experienced in advanced air vehicle and component design. A draft report has been edited following review by the panel.

Committee on Space Station Engineering and Technology Development

The ad hoc committee on Space Station Engineering and Technology Development completed its data collection and review meetings and held a week-long workshop August 19-24, 1984. A report, "Space Station Engineering and Technology Development" was published February 1985.

Committee on NASA-Universities Relationships in Aero/Space Engineering

The ad hoc Committee on NASA-Universities Relationships in Aero/Space Engineering has reviewed NASA's university program in aeronautics and space engineering. A report draft has been prepared and forwarded for NRC's peer review.

Reports Published

Space Station Engineering and Technology Development, - 78 pages - February 1985.

AERONAUTICS AND SPACE ENGINEERING BOARD
COMMISSION ON ENGINEERING AND TECHNICAL SYSTEMS
STATEMENT OF TASK

The Aeronautics and Space Engineering Board was established to focus the talents and energies of the engineering community on significant aerospace policies and programs. It recommends priorities and procedures for achieving aerospace engineering objectives and offers a way to bring engineering and other related expertise to bear on aerospace issues of national importance.

Following are current activities of the Board under Contract NASW-3455:

- o An ad hoc Panel on Vehicle Applications, using as a basis the aeronautical technology projections and opportunities identified by the technology and systems integration panels at the Workshop on Aeronautical Technology in the 1990s, will assess the technological disciplinary and systems advances in the context of potential vehicle applications, to develop advanced flight vehicle concepts for the 2000+ time period.
- o An ad hoc Committee on Space Station Engineering and Technology Development to review NASA's technology development program in support of the design, development and operation of a space station.
- o An ad hoc Committee on NASA-Universities Relationships in Aero/Space Engineering to review NASA's university program and recommend such actions as may be indicated to adjust the program to improve its effectiveness.

In general, the ASEB conducts periodic reviews of the NASA aeronautics and space technology programs considering factors in each category, such as:

Aeronautics

- o The magnitude, direction and emphasis of on-going and planned efforts in aeronautical research and technology.
- o The relative balance in NASA aeronautical activities directed to near-term versus long-term problems.
- o Potential barriers to the introduction and application of new aircraft technology into commercial use.
- o Provision of NASA aeronautical research and technology to other government agencies.

Space Technology

- o Continuing efforts to reduce the cost and enhance the utilization of the shuttle as a space transportation system, including reevaluation, as necessary, of potential military use of the space transportation system.
- o Alternatives methods for achieving the ultimate purpose of new and emerging uses of space.

In implementing its activities on behalf of NASA, the Board maintains continuing liaison with other elements having interest in aeronautics and space, both within the National Research Council (e.g. Space Applications Board, Space Science Board) as well as outside the organization.

The National Aeronautics and Space Administration provides general core support for the Aeronautics and Space Engineering Board under contract NASW-3455, effective October 1, 1980 -- June 30, 1985.

AERONAUTICS AND SPACE ENGINEERING BOARD
COMMISSION ON ENGINEERING AND TECHNICAL SYSTEMS

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* Laurence R. Young
Massachusetts Institute of Technology

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Summary of Activities
January 1 - March 31, 1985
Aeronautics and Space Engineering Board
Commission on Engineering and Technical Systems

Report
to the
National Aeronautics and Space Administration
under Contract NASW-4003
between the
National Aeronautics and Space Administration
and the
National Academy of Sciences

April 1985

The total summary of activities of the Aeronautics and Space Engineering Board (ASEB) for the period January 1, 1985 - March 31, 1985 is in two reports. One report covers the activities under Contract NASW-3455 and the other covers the activities under Contract NASW-4003. These reports fulfill a contractual obligation to the National Aeronautics and Space Administration. This report covers the activities under Contract NASW-4003 and is the second summary-of-activities report to be submitted under contract NASA-4003 which began October 1, 1984 and will expire on September 30, 1986. The Statement of Task in effect during this reporting period is attached. (Attachment 1)

ASEB Meetings

There were no meetings of the Board during this reporting period.

ASEB Membership

The current Board membership is shown in Attachment 2.

ASEB Committee Activities

Committee on Space Station Engineering and Technology Development

In response to NASA's request, the ad hoc committee on Space Station Engineering and Technology Development Phase II to review and assess NASA's program and planning on:

- onboard maintainability and repair
- in-space research and technology
- program performance
- technology development program

was approved by the National Research Council's Governing Board January 7, 1985. A Phase II study plan has been prepared and has the concurrence of NASA technical representatives. Planned activities are as follows:

Maintainability	Round Table	MSFC	March 20-21, 1985
R&T in Space	Workshop	LaRC	May 21-22, 1985
Solar Thermodynamics	Workshop	LeRC	June 10, 1985
Program Performance	Round Table	JSC	June 18-19, 1985
On Board Command/ Control	Round Table	JSC	June 19-20, 1985
R&T Road Maps	Workshop	Woods Hole	Sept. 11-13, 1985

The maintainability meeting was held on schedule and a draft report of the proceedings has been prepared and is being reviewed by the panel.

Committee to Assess Current and Future Capabilities
in Computational Fluid Dynamics

As a result of discussions with NASA's Office of Aeronautics and Space Technology, a committee to study/survey, categorize, and assess existing codes and supporting software for aerodynamic applications to provide part of the foundation upon which the next level of development in computational fluid dynamics will advance was approved by the National Research Council's Governing Board on February 19, 1985. Membership of an approximately 10 person committee is currently under consideration. A one-year study is planned and the first meeting of the committee is planned for late May or early June, 1985.

Reports Published

No reports were published during this period under contract NASW-4003 (see report on activities under Contract NASW-3455 for this reporting period).

AERONAUTICS AND SPACE ENGINEERING BOARD
COMMISSION ON ENGINEERING AND TECHNICAL SYSTEMS

STATEMENT OF TASK

The Aeronautics and Space Engineering Board was established to focus the talents and energies of the engineering community on significant aerospace policies and programs. It recommends priorities and procedures for achieving aerospace engineering objectives and offers a way to bring engineering and other related expertise to bear on aerospace issues of national importance.

Following are current activities of the Board under contract NASW-4003:

- o An ad hoc Committee on Space Station Engineering and Technology Development II - to review NASA's program on several specific aspects of the space station effort; a round table on space station maintainability, a workshop on in-space R&T, a round table on program performance, and a workshop on the R&T program for future space station improvement.

An ad committee to study/survey, categorize, and assess existing codes and supporting software for aerodynamic applications to provide part of the foundation upon which the next level of development in computational fluid dynamics will advance.

In general, the ASEB conducts periodic reviews of the NASA aeronautics and space technology programs considering factors in each category, such as:

Aeronautics

- o The magnitude, direction and emphasis of on-going and planned efforts in aeronautical research and technology.
- o The relative balance in NASA aeronautical activities directed to near-term versus long-term problems.
- o Potential barriers to the introduction and application of new aircraft technology into commercial use.
- o Provision of NASA aeronautical research and technology to other government agencies.

Space Technology

- o Continuing efforts to reduce the cost and enhance the utilization of the shuttle as a space transportation system, including reevaluation, as necessary, of potential military uses of the space transportation system.
- o Alternatives methods for achieving the ultimate purpose of new and emerging uses of space.

In implementing its activities on behalf of NASA, the Board maintains continuing liaison with other elements having interest in aeronautics and space, both within the National Research Council (e.g. Space Applications Board, Space Science Board) as well as outside the organization.

The National Aeronautics and Space Administration provides general core support for the Aeronautics and Space Engineering Board under contract NASW-4033, effective October 1, 1984 -- September 30, 1986.

AERONAUTICS AND SPACE ENGINEERING BOARD
COMMISSION ON ENGINEERING AND TECHNICAL SYSTEMS
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* John L. McLucas
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Irwin Mendelson
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